LIII. *An Account of the* Sea Pen, *or* Pennatula Phoſphorea *of* Linnæus; *likewiſe a Deſcription of a new Species of* Sea Pen, *found on the Coaſt of* South-Carolina, *with Obſervations on* Sea-Pens *in general. In a Letter to the Honourable* Coote Moleſworth, *Eſq; M. D. and F. R. S. from* John Ellis, *Eſq; F. R. S. and Member of the Royal Academy at* Upſal.

Dear Sir,

Read Dec. 22, 1763.

I Should make ſome apology for deferring ſo long the account I promiſed you of the Animal you were ſo kind to ſend me in February 1762, which was taken in a trawl in 72 fathoms water near the harbour of Breſt in France; but a new ſpecies coming to my hand occaſioned this delay. This curious ſea-production, I find, by your letter, you took for a new kind of coralline, and not without reaſon, when upon examining it (as it was not long taken out of the ſea) there were ſtill remaining ſeveral of the ſuckers like heads of Polypes diſpoſed along its ſickle-ſhaped Pinnulæ. But when you hear of more of its properties, you will agree with me, that it belongs to another claſs of Animals; I ſhall mention only one at preſent, till I come to deſcribe it more particularly, and that is, that it floats or ſwims about freely in the ſea; whereas Corals, Corallines, Alcyonia, and

all

all that order of beings, adhere firmly by their baſes to ſubmarine ſubſtances.

This Animal was well known to the ancients by the name of the Sea-Pen; many of the old authors took it for a Fucus or Sea-Plant.

This ſpecies of yours has been found in the Ocean from the coaſt of Norway to the moſt remote parts of the Mediterranean Sea, and not only dragged up in trawls from great depths of the ſea, but often found floating near the ſurface.

Dr. Shaw, in his Hiſtory of Algiers, remarks that they afford ſo great a light in the night to the fiſhermen, that they can plainly diſcover the fiſh ſwimming about in various depths of the ſea. From this extraordinary property Doctor Linnæus calls this ſpecies of Sea-Pen, *Pennatula Phoſphorea,* and remarks, after giving the ſynonyms of other authors, *Habitat in Oceano fundum illuminans.*

In order to attempt a deſcription of it; the outward appearance of this Animal is not unlike one of the quill feathers of a bird's wing, but they are found of different ſizes from 4 to 8 inches in length; this of yours is about 4 inches long; the lower half of it, is naked round and white, not unlike the quill part of a writing pen; the upper part repreſents that of the feathered part of the pen, and is of a reddiſh colour, but faded by ſoaking it often in water in order to examine it more minutely. This upper half (which ariſes from the quill and is feathered on both ſides) is a little compreſſed and becomes ſmaller and ſmaller till it ends in a point at the top; along the back of this, in the ſame manner as in the inner ſide of a common writing pen, there is a groove in the middle from the quill to the extremity: from each ſide of this upper part of the ſtem proceed little parallel feather-like fins; theſe begin at the top of the quill part, very ſmall on each ſide at firſt, but lengthen as they advance towards the middle; from hence they ſhorten gradually on each ſide, till they end at a point at the top; their terminations preſerving on each ſide the figure of the ſegment of a circle. I come now to conſider more minutely thoſe Pinnulæ, or feather-like fins, that project on each ſide and form the upper part of this animal. Theſe are evidently deſigned by nature to move the animal backward or forward in the ſea, conſequently to do the office of fins, while at the ſame time, by the appearance of the ſuckers or mouths furniſhed with filaments or claws, they were certainly intended to provide food for its ſupport; for notwithſtanding what Dr. Linnæus has ſaid in regard to its mouth in his ſyſtem of nature, viz. *Os baſeos commune rotundum*, I could not, with the help of the beſt glaſſes, diſcover that the point of the baſe was penetrated in the leaſt, ſo that I am clearly of opinion, that this animal, like the Hydra Arctica or Greenland Polype, which I have deſcribed in my Eſſay on Corallines, nouriſhes and ſupports itſelf by theſe ſuckers or Polype-like figures; that by theſe, both kinds take in their food, and have no other viſible means of diſcharging the exuviæ of the animals they feed upon, than by the ſame way which they take them in; and that, from attentively conſidering the ſtructure and manner of living of both theſe animals, I ſhall make no doubt in claſſing them in the ſame genus of Pennatula, though they vary very much in their exterior form and ſize, and conſequently are of very different ſpecies.

The ſtem of the ſuckers of this animal is of a cylindrical form; from the upper part proceed 8 fine white filaments or claws to catch their food: when they retreat on the alarm of danger they draw themſelves into their caſes, which are formed like the denticles of the Corallines; but here each denticle is furniſhed with ſpiculæ, which cloſe together round the entrance of the denticle, and protect this tender part from external injuries.

Some time after I had made my remarks on this very extraordinary animal, the Royal Society did me the honour to recommend to me, for my opinion, ſome very curious obſervations lately publiſhed by Dr. Bohadſch of Prague, a book of great merit, which ſhews that the author has taken a good deal of pains, in examining very minutely into thoſe animals called by the old authors Zoophytes: but as many of them have not the leaſt reſemblance to vegetables, I ſhall beg leave to paſs over ſuch, and only confine myſelf to this claſs of the Penna marina, which he ſeems to have been happy in obſerving; and therefore ſhall take the liberty to add ſuch of his obſervations, as the opportunity of his ſeeing this animal alive in ſea-water afforded him, without which it would have been impoſſible for me to have had the pleaſure of gratifying you, and the reſt of the Royal Society, ſo fully on the ſubject.

Some of the moſt curious remarks of Doctor Bohadſch on the anatomy of this animal, as alſo on the appearance of it while alive in ſea-water, are as follows.

" When the trunk is opened lengthways, a ſalt-
" iſh liquor flows out of it, ſo viſcid as to hang
" down an inch; the whole trunk of the ſtem is
" hollow, its outward coriaceous membrane is more
" than a line thick, and forms a ſtrong covering
" to it: between this and another thinner membrane
" of the pinnated part of the trunk are innumerable
" little yellowiſh eggs, floating in a whitiſh liquor,
" about the ſize of a white poppy ſeed; theſe are
" beſt ſeen, when the trunk is cut acroſs: This
" thin membrane lines the whole inſide of the
" trunk, in which we obſerve nothing but a
" kind of yellowiſh bone, which takes up three
" parts of the cavity.

" This bone in ſome of theſe animals is above
" 2 $\frac{1}{2}$ inches long and about half a line thick; in
" the middle part of it, it is four ſquare or quad-
" rangular; towards each end of it, it grows round
" and very taper: that end is ſmalleſt, which is
" neareſt the top of the pinnated trunk. The
" whole bone is covered with a yellowiſh clear
" ſkin, which at each end changes into a liga-
" ment; one of which is inſerted in the top of
" the pinnated trunk, the other in the top of the
" naked trunk; by the help of this upper liga-
" ment, the end of this little bone is either con-
" tracted into a very narrow arch, or diſ-
" poſed into a ſtraight line, according to the
" motion of the trunk.

" The fins likewiſe are compoſed of two ſkins;
" the outward one ſtrong and leathery and covered
" over with an infinite number of crimſon ſtreaks,
" the inner ſkin is thin and clear: The cylindrical

“ part of the ſuckers are in the ſame manner, only “ with this difference, their outward ſkins may be “ ſofter.

“ Both the fins and ſuckers are hollow, ſo that “ the cavity of the ſuckers may communicate with “ the fins, as their cavity does with the trunk.

“ We now come to the appearance which this “ animal makes when alive in ſea-water.

“ The trunk then was contracted circularly at “ the bottom of the naked part of the ſtem, and “ by this contraction formed a zone of the moſt “ intenſe purple, which moved upwards and “ downwards ſucceſſively: When it moved up-“ wards through the length of the pinnated trunk, “ it there became paler, and at length terminated “ at the top: the motion being ſcarce finiſhed, a “ like zone appeared at the end of the naked trunk, “ which finiſhed its motion in the ſame manner “ as the former.

“ When this zone becomes very much con-“ ſtricted on every ſide, the trunk above it ſwells “ and acquires the form of an onion; and then “ it appears, as if a compreſſed globe moved along “ through the whole ſpace of the trunk; this con-“ ſtriction of the trunk gives that fine red colour “ to the zone; for when the ſkin of the trunk “ is outwardly full of purple papillæ, the interme-“ diate ſpaces are of a whitiſh colour. In this “ conſtriction then of the ſkin the intermediate “ ſpaces are obliterated and the papillæ are “ brought nearer together; conſequently only the “ purple colour preſents itſelf to the eyes and ap-“ pears more bright.

" Moreover the end or apex of the naked trunk " is ſometimes curved like a hook, and ſometimes " extended in a right line; both theſe motions " then muſt be directed by the little bone in the " inſide, and from this motion of this little in- " ternal bone, that ſinus or cavity at the lower end " of the trunk (thought by authors heretofore to " be the mouth) ſeems plainly to be formed; for " ſometimes it is deeper, ſometimes ſhallower; " it is deeper while the moveable globe appears " in the middle of the pinnated part of the trunk, " and ſhallower when it is in the bottom of the " naked trunk, at which time the bone is moſt " extended.

" The fins or pinnulæ have four different motions; " they are moved both towards the naked ſtem, " and towards the pinnated ſtem; ſometimes they " are drawn in very much to the belly, a little af- " ter they are inclined to the back; further, the " fleſhy filaments or claws move in all directions, " and the cylindrical part with the filaments is " either extended out or drawn in and hid in " the fins." Doctor Bohadſch concludes this chapter by obſerving, that there are ſome varieties to be met with in theſe red Sea-Pens: ſome, he ſays, are paler and inclining to a roſe colour, others of an intenſe deep red: in the firſt kind he remarks that there are fewer denticles or tentacula (from whence the ſuckers proceed) in the fins, and that theſe are placed in one row within half a line of one another; but in the latter, he ſays, the tentacula are placed in a double row and as near as they can be together: this is the Pennatula of which I have juſt now given you his account, and which he ſaw alive in ſea-water. The other ſeems to be the ſame with yours, and is, no doubt on it, Linnæus's *Pennatula Phoſphorea*, ſo that heconcludes them to be two diſtinct ſpecies, and calls them by the following names, viz.

Penna (Rubra) pinnis falciformibus, tentaculis in pinnarum facie concava denſiſſime diſpoſitis.

Penna (Roſea) pinnis falciformibus, tentaculis in pinnarum facie concava laxe diſpoſitis.

In the three following chapters Dr. Bohadſch deſcribes three other kinds of Sea-Pens. One he calls *Penna Griſea* or the Grey Sea-Pen with crenated fins; this is figured and deſcribed from a dry ſpecimen in Seba's Muſeum, Tom. III.

The next is a very ſingular one without fins, having a ſquare bony ſtem 2 feet 10 inches long, covered with a ſkin, and furniſhed on 3 ſides with tentacula or ſuckers: but this was unfortunately broken off at the bottom before he received it: he ſays, the fiſhermen call it *Penna del Peſche de Pavone*, or the Feather of the Peacock-fiſh. To theſe he has added the Alcyonium called, *Manus marina*; he calls it *Penna ramoſa pinnis carens, tentaculis in ramis poſitis*, and in another place, *Penna Exos*. In order to give you and the reſt of the Royal Society ſome idea of theſe extraordinary Animals, I have copied his figures, and alſo the figures of the three laſt ſpecies of Linnæus's Pennatula, viz. his *Pennatula (Filoſa) Pennatula (Sagitta)* and *Pennatula (Mirabilis)* from the authors which he refers us to, and have added an exact delineation of our *Alcyonium (Manus marina)* or Dead mans hand, with ſome microſcopial drawings of different ſections of it, to ſhew that although the ſubſtance of it is fleſhy, yet that it approaches much nearer to the

Madrepora Corals, than to any known ſpecies of the genus of Animals called Pennatula. — At the ſame time I allow his remark to be very juſt, where he obſerves that the *Hydra Arctica* or Great Greenland Polype, which I have deſcribed in the Philoſophical Tranſactions, and in my Eſſay on Corallines, is certainly a ſpecies of Pennatula; but he will find, from both the drawing and deſcription, which I have given of it, that it is not fixt by its baſe, but floats freely about in the ſea; whereas this Alcyonium as well as his (which differs in colour from ours) are always found fixt by their baſe to ſome ſolid ſubmarine body, and conſequently cannot be admitted among the Pennatulæ.

I muſt now conclude this letter with a ſhort account of a new diſcovered ſpecies of Pennatula, which my ingenious friend John Greg Eſq; of Charles Town in South-Carolina, diſcovered on that coaſt and preſented to me ſome time ago. This beautiful purple animal is of a compreſſed kidney ſhape. The body is about an inch long, and half an inch acroſs the narroweſt part, it has a ſmall roundiſh tail of an inch long proceeding from the middle of the body, its tail is full of rings from one end to the other like an Earth-Worm, and along the middle of the upper and under part of it there is a ſmall groove which runs from one end to the other. I examined carefully the point of the tail and could find no perforation in it, which is agreeable to what I have obſerved in the reſt of this genus.

The upper part of the body is convex and near a quarter of an inch thick; the whole ſurface of it is covered over with minute yellow ſtarry openings, through which are protruded little ſuckers like polypes each furniſhed with 6 tentacles or filaments, like what we obſerve on ſome of the Corals, and ſeem to be the proper mouths of the animal. The under part of the body is quite flat, this ſurface is full of the ramifications of fleſhy fibres, which, proceeding from the inſertion of the tail, as their common center, branch themſelves out, ſo as to communicate with the ſtarry openings on the exterior edge and upper ſurface of this uncommon animal: for a clearer idea I muſt refer you to the figure of this, as well as that of your own Pennatula, and am,

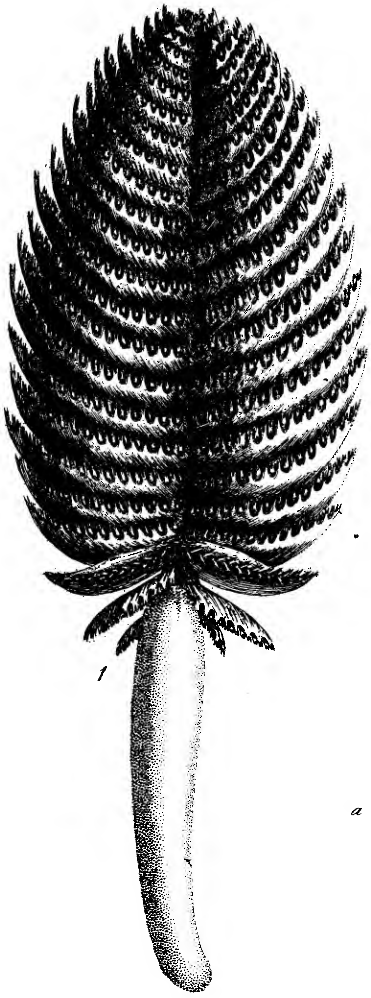
Dear Sir,

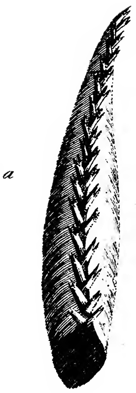
Your much obliged

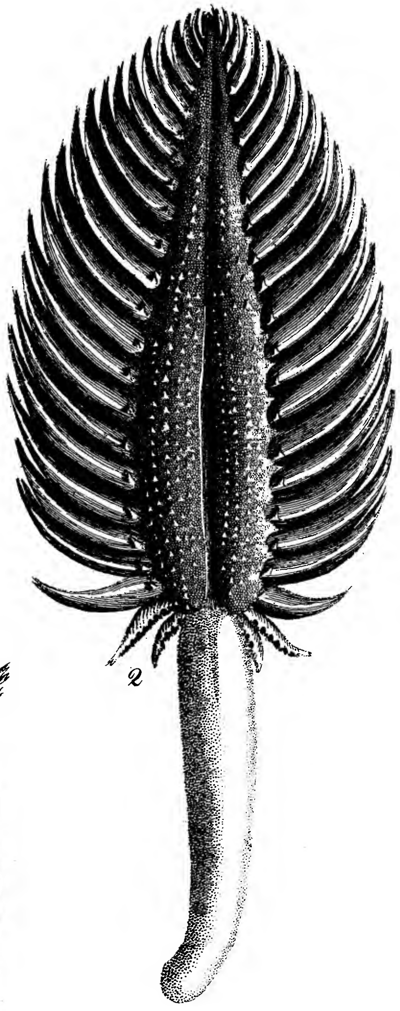
London, Dec. 15, 1763.

Humble Servant,

John Ellis.







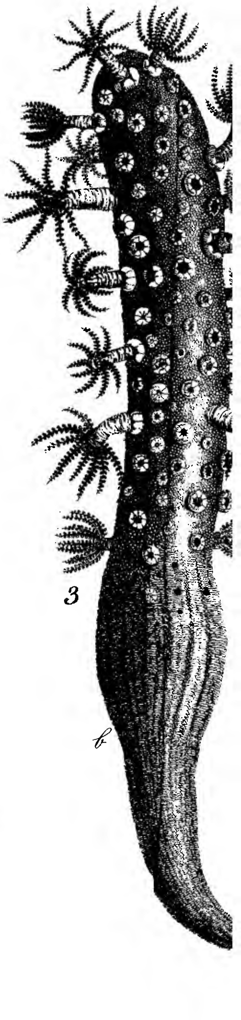
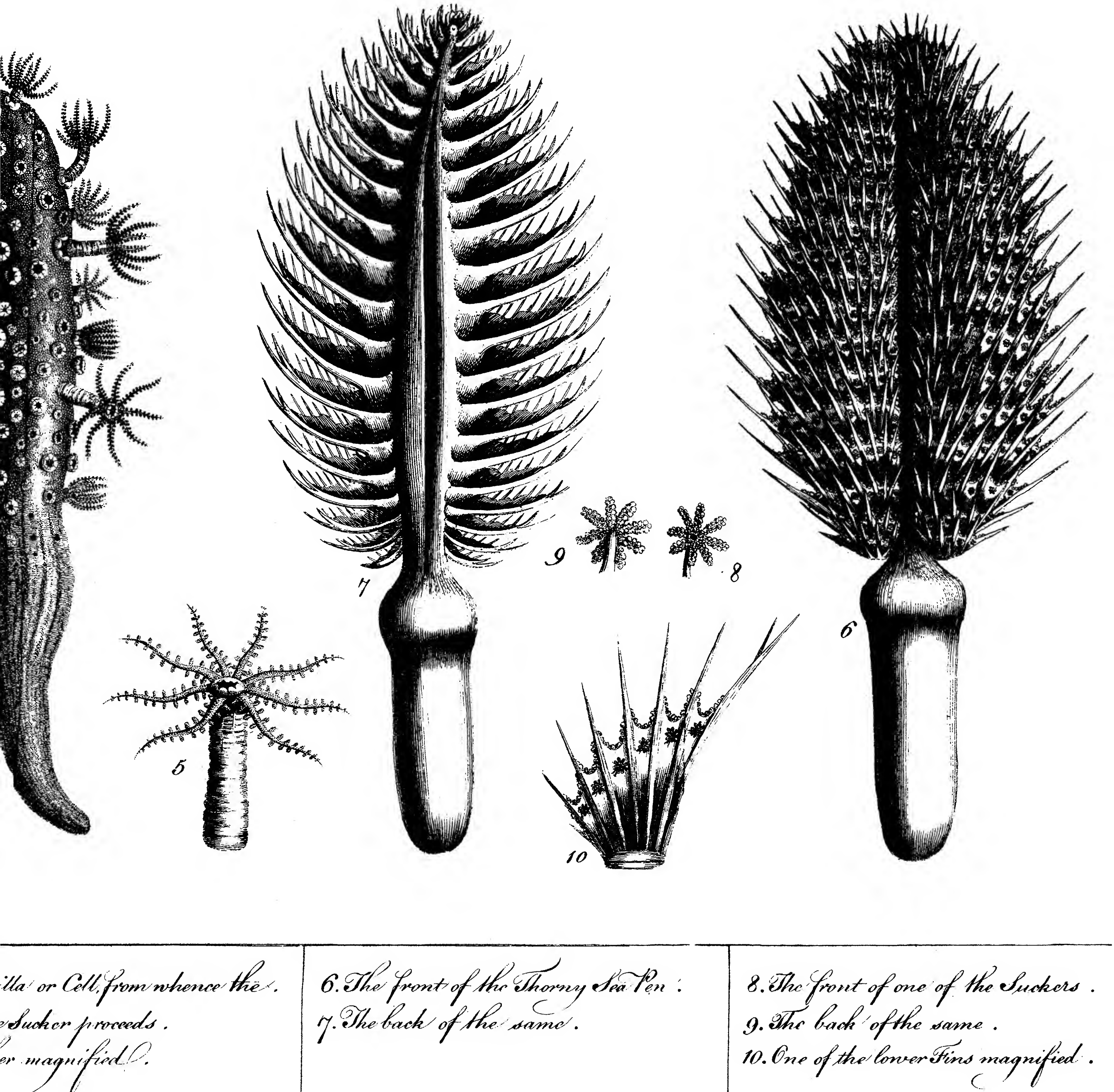


FIG.1. The front of the red Sea Pen.
2. The back of the same.
a. One of the Fins shewing the Order in which the Denticles are placed.

3. The Finger shap'd Sea Pen, or Cynomorion.
b. The Furrows shew, that the Animal can extend, or contract this Part.

4. The Papilla or C
Polype like Sucker
5. The Sucker magn



illa or Cell, from whence the
Sucker proceeds.
er magnified.

6. The front of the Thorny Sea Pen:
7. The back of the same.

8. The front of one of the Suckers.
9. The back of the same.
10. One of the lower Fins magnified.

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Philos. Trans. Vol. LIII. Tab. XX. p. 429.

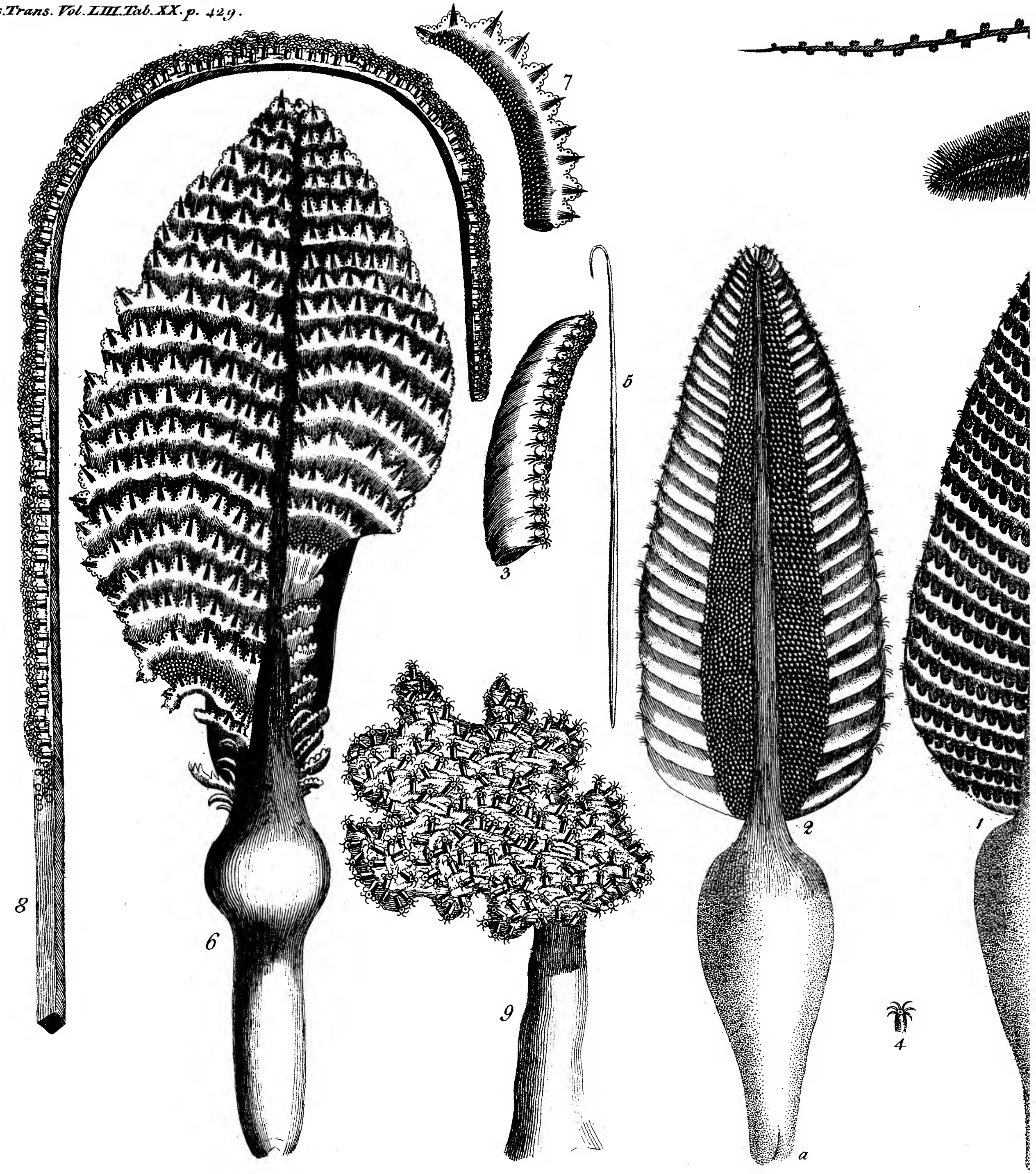

FIG. 1 and 2 The front & back of Dr. Bohadsch's red Sea Pen. a a The hollow or Sinus at the bottom of it.
3. One of the Fins magnified. 4. One of the Suckers seperated. 5. The bone taken out of the middle part of the pennatal Stem.
6. His gray Sea Pen. 7. One of it's crenated Fins. 8. His Sea Pen call'd the Pen of the Peacock Fish.
9. The Alcyonium manus marina, or dead man's hand call'd by Dr. Bohadsch Penna Exos.

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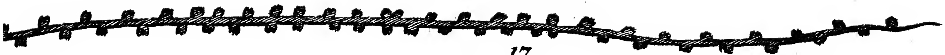

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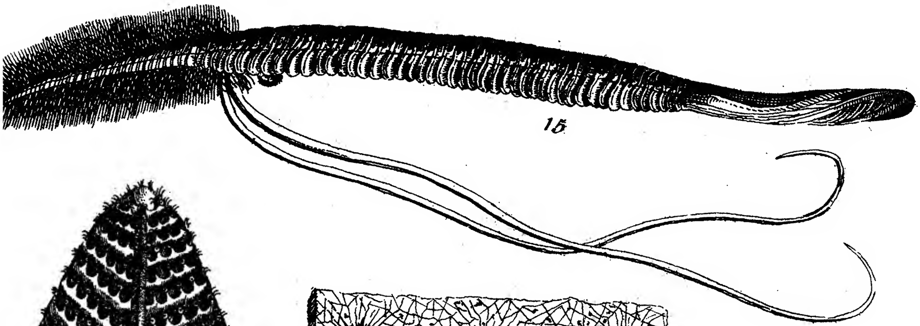

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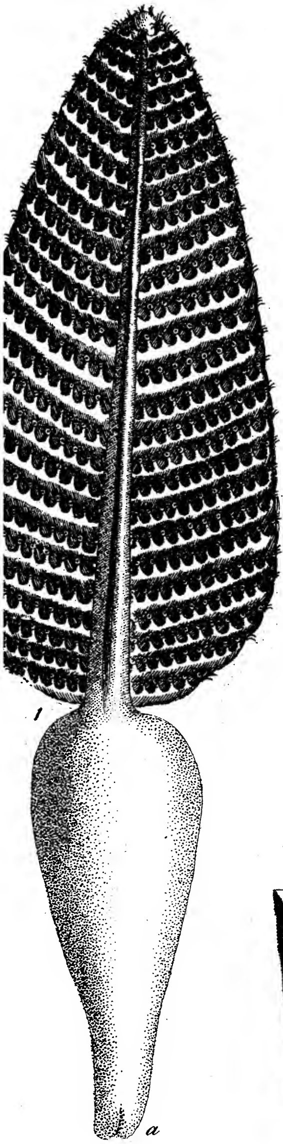

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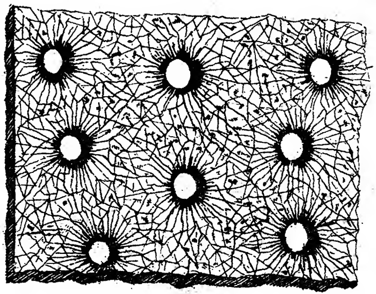

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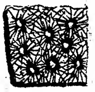

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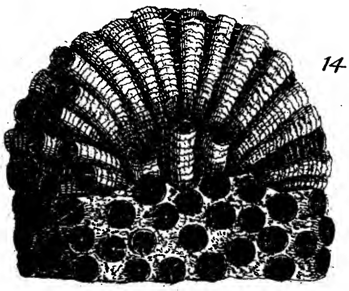

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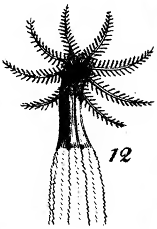

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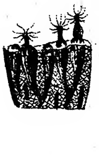

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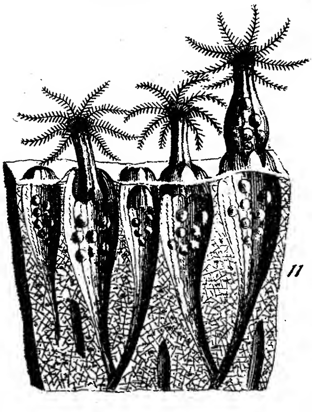

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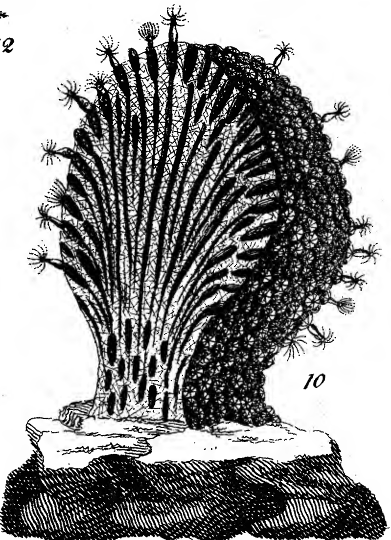

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10. The English Alcyonium manus marina. 11. An upright Section of it magnified. b. The natural Size. 12. The Polype like Sucker taken out of its Cells.
13. A croſs Section magnified. c The natural Size.
14. A Madrepora Coral form'd like the Alcyonium.

15. Linnæus's Pennatula filosa.
16........D° Pennatula Sagitta.
17........D° Pennatula Mirabilis.

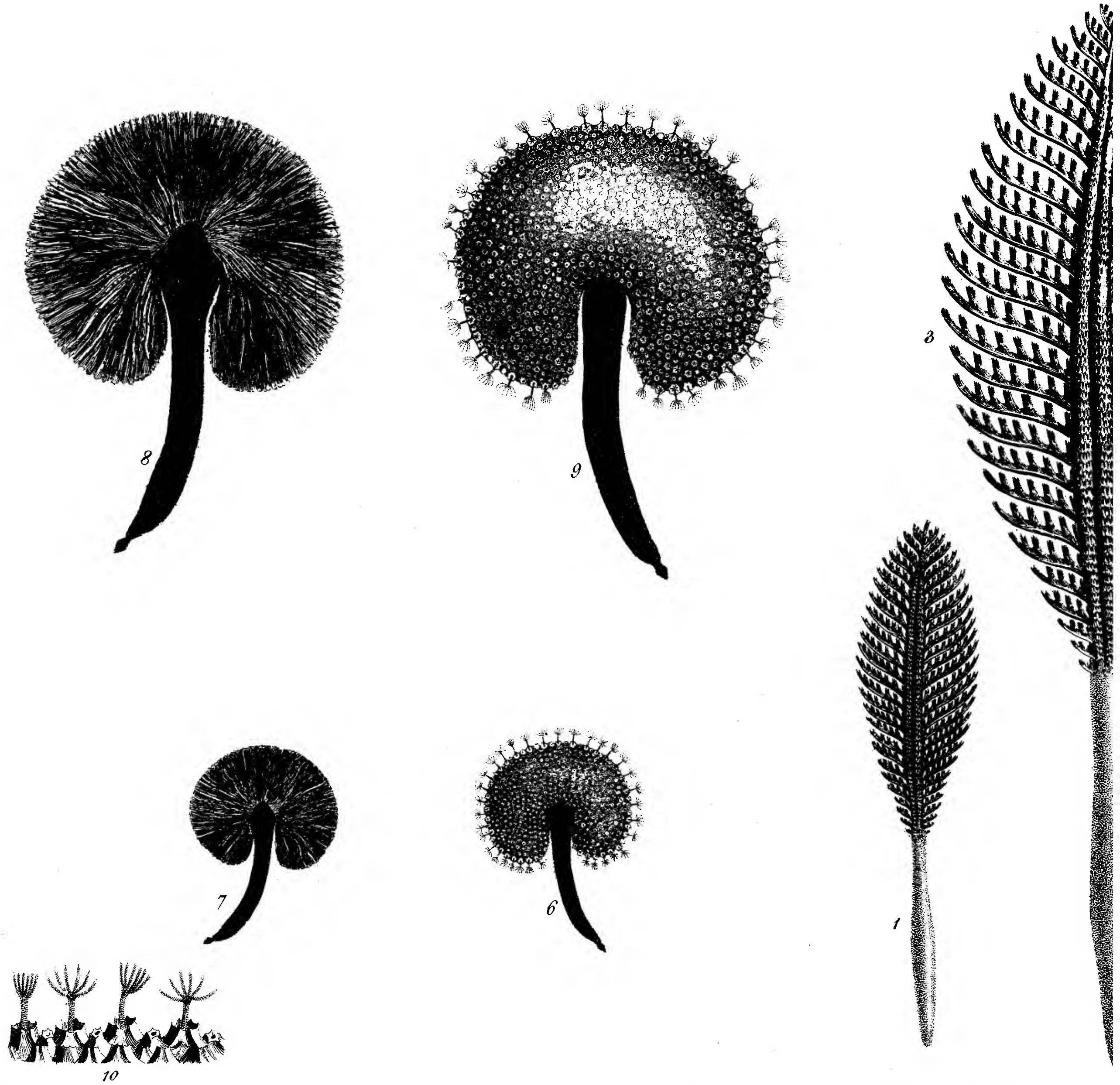
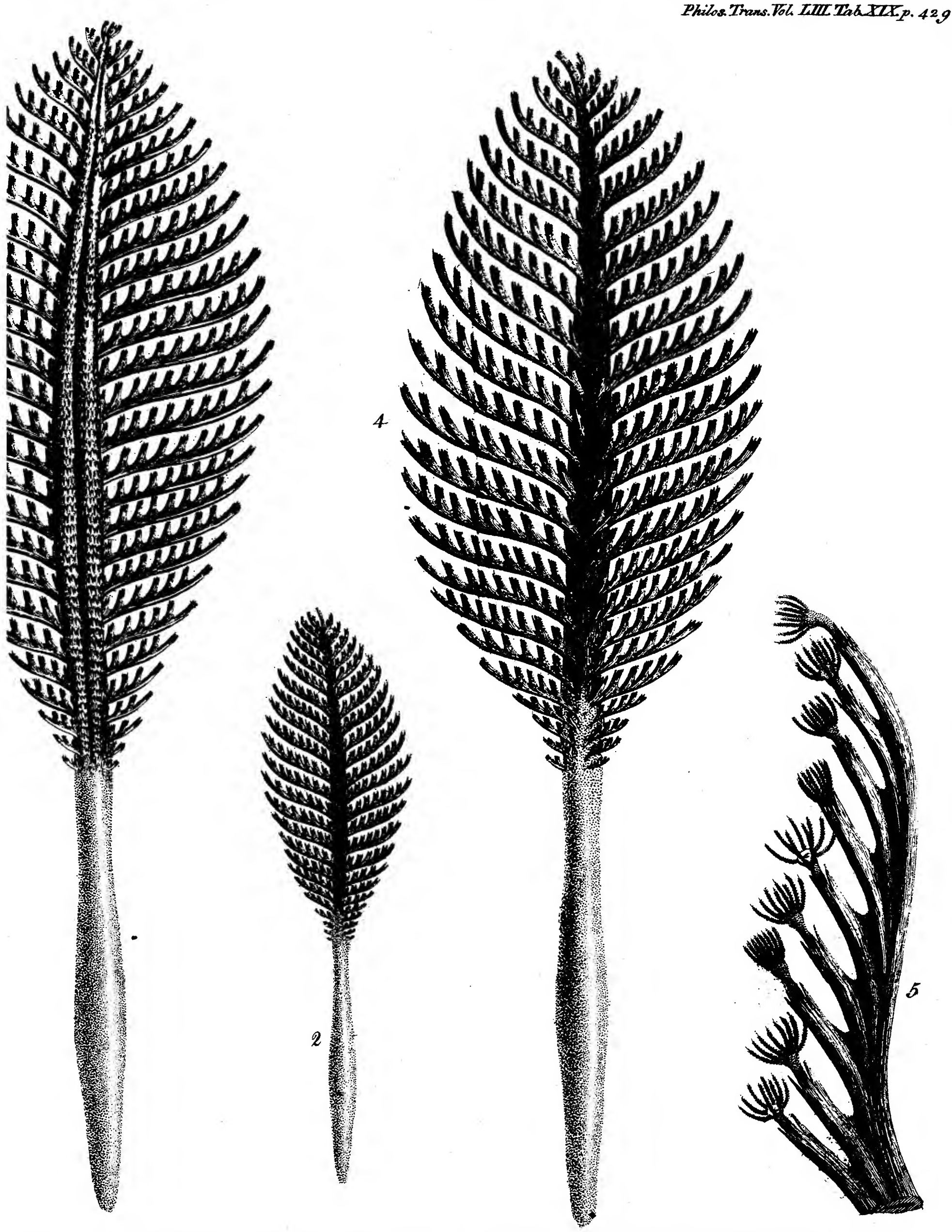


FIG 1. The back of the Sea Pen or Pennatula Phosphorea of Linnæus, from the Coast of Brest. 2 The fore part of the same.
3 and 4. Both Sides magnified. 5. One of the Fins highly magnified to shew the Polype-like Suckers.

6. The Kidney shap'd purple Sea Pen from S. Carolina, w
openings on the Back.
7. The under Part of the same shewing the branch'd Fibres con
rays from the insertion of the Stem.



rolina, with the Starry
Fibres coming out like

8 and 9. Both Sides of the Kidney shap'd Sea Pen magnified.
10 A part of the edge of the upper Surface highly magnified to shew the Suckers & openings of the Cells.

P. S. Juſt when the two plates XIX and XX of the Pennatula were finiſhed, and ſent to the Printer, I received three kinds of Sea-Pens, finely preſerved in ſpirits, from my learned friend Thomas Pennant Eſq; of Bychton in Flintſhire, which he informs me were ſent him from the Mediterranean-Sea. One of them is intirely new to me, and, I believe, not yet deſcribed; the other two, which are the Red and the Gray Sea-Pens of Dr. Bohadſch, are ſo very indifferently deſigned by the Doctor's painter, and which I have copied in Plate XX, that I thought a better drawing would give you a clearer idea of theſe ſtrange animals, and be more agreeable to the Royal Society in general.

An Explanation of the Plates.

Plate XIX.

FIG. 1. The back part of the Red-Sea-Pen, or *Pennatula Phoſphorea* of Linnæus. This was found on the coaſt of France, they are frequently met with on the coaſts of Norway and Sweden.

2. The front of the ſame.

3. and 4. Both ſides of the ſame magnified.

5. One of the fins more highly magnified, to ſhew the Polype-like ſuckers by which it takes in its nouriſhment.

6. The kidney-ſhap'd purple Sea-Pen from South-Carolina in its natural ſize; this upper part is full

of ſtarry openings, which ſend out ſmall ſuckers like polypes by which it feeds.

7. The under part of the ſame, with its ramifying fibres, that lead from the inſertion of the ſtem as from a center to the circumference, and correſpond with all the ſtarry openings on the edge and back of it.

8 and 9. Both ſides of this animal magnified.

10. A part of the exterior edge higher magnified, to ſhew the form of the ſtarry openings and ſuckers, which conſiſt of 6 rays and claws.

Plate XX.

The four following Sea-Pens were found by Dr. Bohadſch, in the Sea, near Naples.

Fig. 1. Repreſents the forepart of the Red-Sea-Pen with many rows of ſuckers on its fins.

2. The back part, the middle of which is covered with the appearance of ſmall papillæ.

3. One of the fins magnified.

4. One of the ſuckers ſeparated.

5. The bone taken from the internal part of the pinnated trunk; this is faſtened to ligaments at both ends which are likewiſe inſerted in both ends of the animal. When the ligament at the baſe is contracted, it forms that ſinus at *aa*, that has been taken for a mouth by moſt authors.

. The Grey-Sea-Pen.

. One of its crenated fins. *N. B.* There is a figure of this Sea-Pen taken from a dried ſpecimen in the third tome of Seba's Muſeum.

8. The Sea-Pen called by the Italian Fiſhermen *Penna del peſche Pavone*, or the Pen of Peacock Fiſh; this appears to be broken off, and is deſcribed to be yet 2 feet ten inches long, the ſquare bony part of this is not ſo hard as that in the Red-Sea-Pen.

9. This laſt of Dr. Bohadſch's four Sea-Pens is the *Alcyonium* called by authors *Manus marina*, or vulgarly Dead-man's Hand: he calls it *Penna Exos* and the branched Sea-Pen without fins having ſuckers placed on its branches: but it by no means belongs to this claſs of animals, which float freely about in the ſea; whereas this adheres to Rocks, Shells, or other marine ſubſtances. I have introduced our *Alcyonium Manus marina* or Dead-man's Hand, which is found in great plenty all round the coaſts of the Britiſh Iſlands, to ſhew its internal ſtructure, and how near it comes to the Madrepora Coral, which appears by it growth and form to be produced by animals of the ſame ſhape.

10. A piece of the *Alcyonium Manus marina*, cut perpendiculary through the middle, to ſhew that it is formed of tubes, which branch out into others, each ending on the ſurface in a ſtarry opening of 8 rays; in each of theſe openings is a polype-like figure or ſucker with eight claws, faſtened to the inſide of the tube at it's lower part by 8 fine tender filaments, by which it can raiſe or ſink itſelf at pleaſure in its tube: all theſe tubes that compoſe this Alcyonium are connected together by minute reticulated fibres; theſe incloſe a kind of ſtiff gelatinous ſubſtance, which ſeems to be the fleſh of this compound animal, and theſe fibres with their incloſed contents to be the muſcles; for by the exertion of theſe it aſſiſts in opening or cloſing the ſtars on the ſurface, while the ſuckers or polype-like figures are puſhing themſelves out in ſearch of food, or when they are retreating to ſecure themſelves from danger.

11. Is the magnified part of an upright ſection of this Alcyonium repreſented in its natural ſize at. *b*. Here the polype like ſuckers appear in different attitudes; one has extended itſelf through the ſtarry opening, and is ſending forth it's ſpawn or eggs; at the baſe of the next ſucker you may obſerve ſome of the tender filaments by which it is fixt to the bottom of the tube; the ſucker next to this is contracted and its ſtarry opening is cloſed over it; the cell or ſtar next to this is cut in half to ſhew the manner that the ſucker is placed in it.

12. Repreſents one of theſe ſuckers taken out of its cell.

13. Is a croſs or horizontal ſection of a piece of this Alcyonium, the natural ſize is expreſſed at *c**.

14. The Madrepora coral is introduced here to ſhew how near it approaches to this Alcyonium in its external appearance and in the ramification of its tubes.

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* The reticulated fleſhy part of this Alcyonium approaches very near to the nature of ſponges; for ſponges, when firſt taken out of the ſea, are filled with a gelatinous or mucous matter of a ſtrong

The other 3 figures in this plate are introduced to ſhew the form of the Pennatula referred to by Dr. Linnæus, in his Syſt. Nat. 10 Ed. p. 819.

15. Is the *Pennatula Filoſa,* and is figured in Boccone's Recherches, pl. 287, pag. 287. This animal infeſts the Xiphias or Sword-fiſh in the Mediterranean-Sea by ſucking their blood, and is called by Boccone, *Hirudo cauda utrinque pennata.*

16. Is the *Pennatula Sagitta;* it is deſcribed in Linnæi Amœnit's Vol. v. Chin. Lagerſtr, p. 14. f. 3. and ſaid to infeſt the *Lophius Hiſtrio* or Sea-Bat, in the Chineſe Sea.

17. Is the *Pennatula Mirabilis.* This is called the *Polypus Mirabilis,* and is deſcribed in the Muſeum of Adolphus Frederick King of Sweden, p. 96. t 19. f. 4.

ſtrong fiſhy ſmell: Yet I much doubt whether Sponges have ſuch polype-like ſuckers as the Corals, Alcyonia, and Pennatulæ, or are even produced by Worms, as the late ingenious Dr. Peyſonel informs us; for in the title to the ſecond part of his manuſcript on this ſubject, which he dedicates to the Royal Society, he ſays, that Sponges, as well as Corals, Madreporas, &c. are produced by animals that are of a particular ſpecies of Urtica marina or Purpura; but I am inclined to believe he took this for granted from the ſimilitude they bear to Corals, Alcyonia, &c. rather than from actual experiment. I rather take thoſe holes, which I have obſerved in them, to be ſo many mouths upon the ſurface of the animal; and I am the more inclined to believe it, from a remark I made with Dr. Solander at the Sea-Coaſt of Suſſex in the ſummer 1762, on the *Spongia Medullam Panis referens,* while it was in a glaſs veſſel of Sea-Water; where we obſerved, that the Mamillæ that were on the ſurface opened and ſhut, but that no ſucker or animal-like figure appeared to come out.

Explanation of Plate XXI.

Fig. 1. Repreſents the front of the Red-Sea-Pen a little larger than life, as are the figures of the two following Sea-Pens.

a. One of the fins ſhewing, the alternate order in which the denticles incline like the teeth in a ſaw.

2. The back of the Red-Sea-Pen, with the rachis or middle part between the fins covered over with a rough ſkin like ſhaggreen.

3. The finger-ſhaped Sea-Pen, or *Cynomorion*, called ſo from its likeneſs to the ſhape of the *Fungus Melitenſis*.

The upper part of this animal is covered over with circular cells, one of which is repreſented at Fig. 4, from whence proceed Polype-like ſuckers, having eight pennated arms or claws, one of which ſuckers is figured at 5.

The Rugæ or Furrows in the ſwelling part at *b*, ſhew that this animal can extend and contract this part, perhaps to raiſe or fall itſelf in the ſea.

6. The front of the thorny Sea-Pen, called by Dr. Bohadſch *Penna griſea*.

7. The back part of it.

8. Shews the front of one of the ſuckers magnified.

9. —— the back view of the ſame.

10. One of the lower fins a little magnified, which ſhews the poſition of the ſuckers, and

the inſertion of the ſpines; Theſe ſpines are combined of many fine ſpiculæ, which unite and form one ſpine. When theſe ſpines open at top, each forms a ſtar of ſmall ſpiculæ, which nature ſeems to have pointed out as a protection for the mouths or ſuckers underneath, which have no other covering to defend them, whereas in the Red-Sea-Pen there is a circle of ſpiculæ to each ſucker.

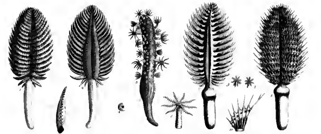

Fig. 1. The front of the red Sea Pen
2 The back of the same
3 One of the Fins shewing the Order in which the Polypes are placed

a A Finger shap'd Sea Pen or Organum
b The Horseshoe shews that the Animal can extend, or contract the Pen

4 The Papilla or Cell from whence the Polype like Sucker proceeds
5 The Sucker magnified

6 The front of the Tawny Sea Pen
7 The back of the same

8 The front of one of the Suckers
9 The back of the same
10 One of the Fins magnified

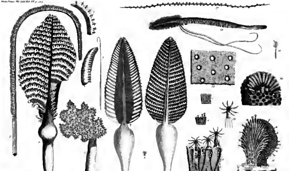

Fig. 1 and 2 The front & back of the [illegible] [illegible] [illegible] the bottom [illegible] at the bottom of [illegible]
3 [illegible] of the [illegible] magnified. 4 [illegible] of the [illegible] as separated. [illegible] taken out of the middle part of the [illegible]
6 [illegible] 7 [illegible] [illegible] [illegible] of the [illegible]
8 the [illegible] [illegible] [illegible]

10 The English [illegible] 11 the upright [illegible]
[illegible] of the natural size 12 [illegible] taken out of [illegible]
13 [illegible] magnified [illegible] the natural size
14 A [illegible] Coral formed like the [illegible]

15 [illegible]
16 [illegible]
17 [illegible]

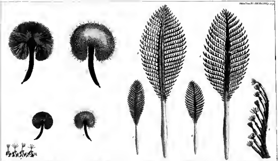

Fig. 1. The Back of the Sea Pen or Pennatula Phosphorea of Linnæus from the Coast of [illegible]. 2 the Fore [illegible] of the same. 3 [illegible] 4 Both sides [illegible] magnified. [illegible] of the Arms highly magnified to show the Polype [illegible]

[illegible]

[illegible] magnified [illegible]